



**NOAA**  
**WEATHER**  
PROGRAM OFFICE

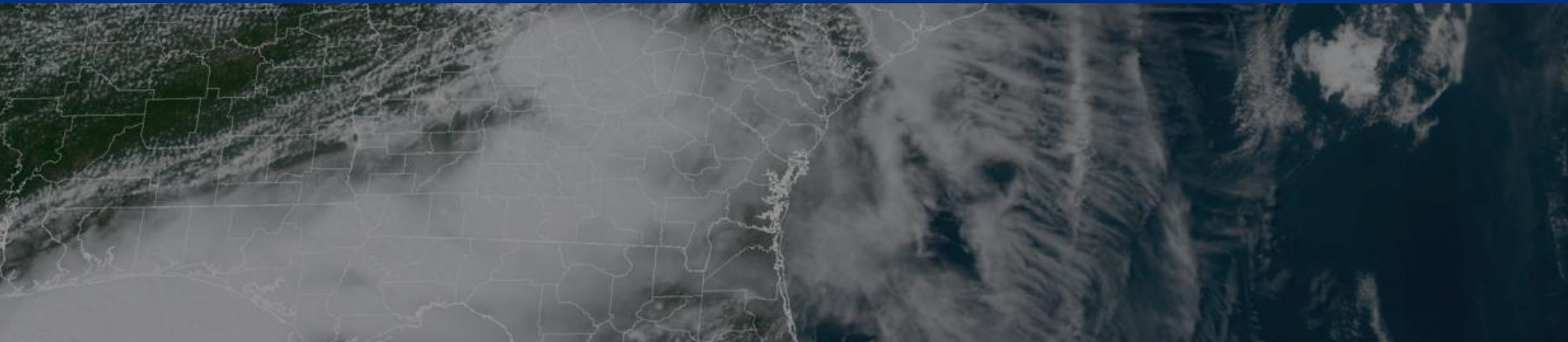
July 18th, 2022

# Setting the Vision

*News/Updates and Opportunities/Challenges*

Dorothy Koch, OAR Weather Program Office Director

Unifying Innovations in Forecasting  
Capabilities Workshop





# Programs, Opportunities, UFS Projects

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## Weather Program Office (Red = UFS Projects)

FY22 Notice of Funding Opportunity (NOFO) ~\$15M

- Testbeds
- Fire-weather, Atmospheric Composition
- S2S
- JTTI: Internal (T20) and External

FY23 Notice of Funding Opportunity (NOFO)

- Observations
- Social, Behavioral and Economic Sciences
- (Innovation program: EPIC and more)

UFS R20 Project: data assimilation, RRFs, more...

EPIC

## FY22 Select Supplemental activities

Collaborative among OAR, NWS, NESDIS, NOS, OCIO

## Disaster Supplemental ~½ UFS

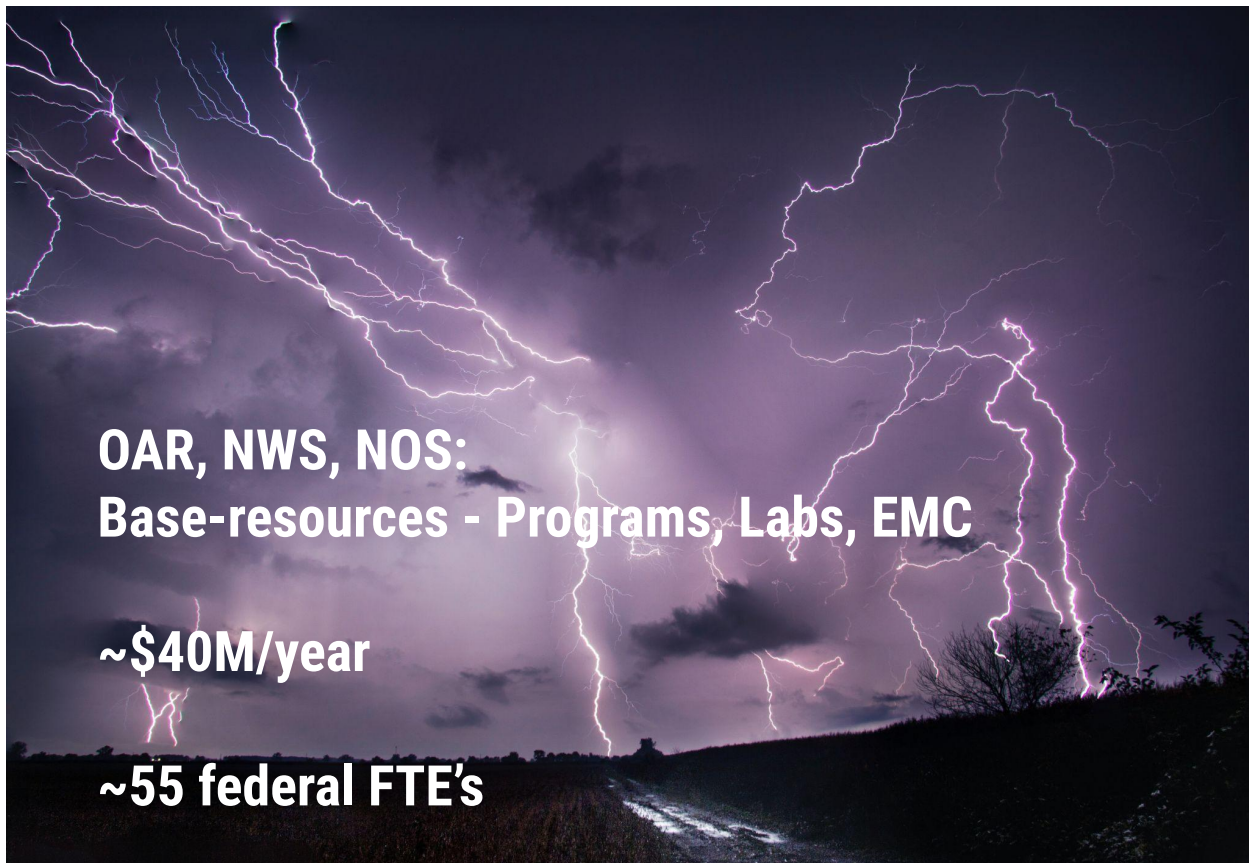
- Hurricane & Precipitation forecasting (~\$35M)
- Wildfire forecasting (~\$20M)
- R&D-HPC (~\$50M)

## Infrastructure Investment and Jobs Act (IIJA)

- Fireweather (~\$50M ORF)
- Floods, Coastal, Service Delivery and Social Science (~\$480M)
- R&D-HPC (~\$95M)

# NOAA's investment in the UFS

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# Organizational



**Unified  
Forecast System**



## **NOAA Modeling Board**

NOAA, Federal, and  
International Coordination

## **EPIC Program**

Process, Budget,  
Communications, and  
Legislative Affairs

## NOAA Modeling Board (NMB)

- Launched in March 2021
- Part of NOAA's Weather, Water, (Ocean) and Climate Board (WWCB).
- Incorporated NOAA's Unified Modeling Committee (UMC)
- Includes and coordinates among all NOAA Line Offices and spans modeling across NOAA
- Working Groups
  - Modeling Strategy
  - Enabling Observations into Models
  - Operational Ocean Forecasting

## Unified Forecast System (UFS)

- New Steering Committee Co-chairs
- Update the UFS Strategy and governance
- Revitalize the Working Groups?
- UFS R20 Project and the UFS Application development

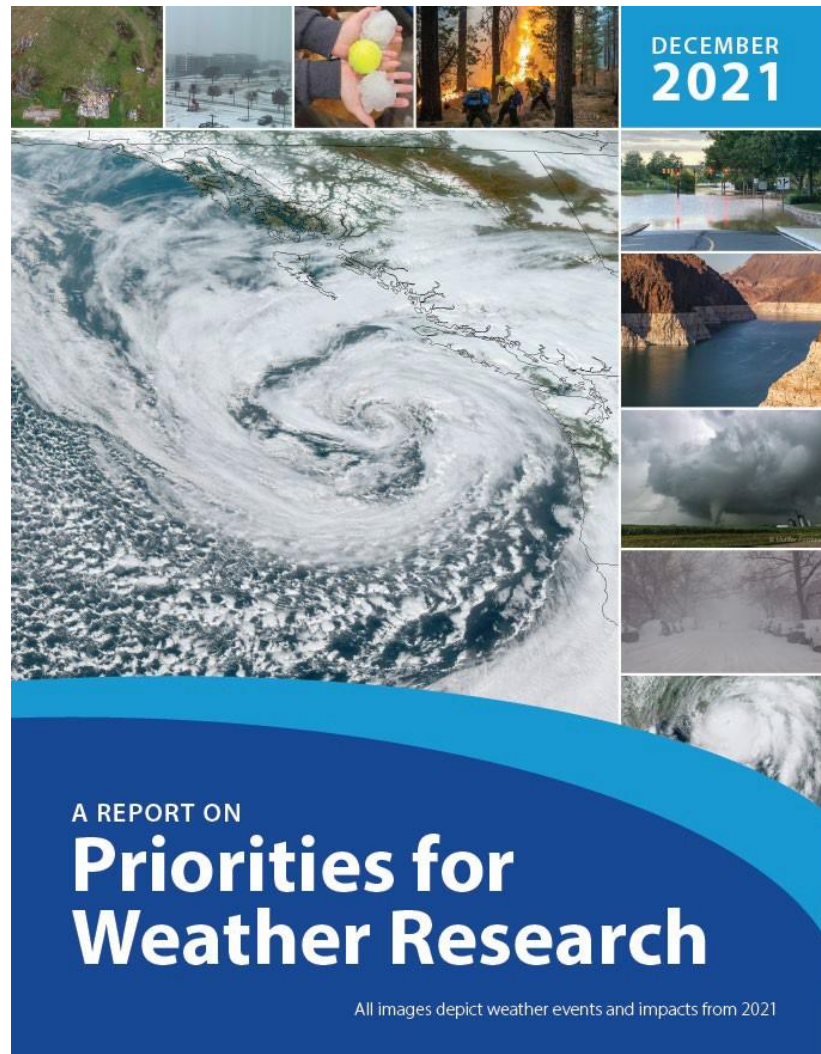
# Drivers: PWR!

## NOAA's Science Advisory Board (SAB) Priorities for Weather Research (PWR)

### PWR Immediate First Steps include:

- **Accelerate Earth system modeling approach**
- **Prioritize fundamental research on data assimilation**
- **Support reanalysis and reforecasting**
- **Target the understanding and prediction of high-impact weather**
- **Target water cycle extremes** and their cascading impacts

[SAB.NOAA.gov](https://SAB.NOAA.gov)



# Drivers: Forecaster needs!

NWS Forecaster-Modeler Workshops  
(2020-21)

Top issues with forecast skill that  
involve model deficiencies



1	<b>Surface temperature</b>
1a	Errors associated with low-level temperature inversions
1b	Errors associated with capping inversions
1c	CAPE issues
1d	Extreme heat index episodes
1e	Visibility, ceiling, clouds and fog
1f	Temperature on complex terrain
1g	Progressive shortwave troughs
1h	Fire weather issues
1i	Temperature in general
2	<b>Precipitation</b>
2a	Precipitation type
2b	Precipitation rate
2c	Extended skill
2d	Extreme Precipitation events
2e	Precipitation over complex terrain
3	<b>Convection</b>
3a	Convective Mode - handling of mesoscale convective system (MCS)
3b	Convective Initiation
3c	Thunderstorms in very short-range
4	<b>Winds</b>
4a	Winds over complex terrain
4b	Winds over oceanic extratropical cyclones
5	<b>Tropical Cyclones</b>
5a	Right-of-track bias
6	<b>Space Weather</b>
6a	General - Space weather



# Grand Challenges: S2S precipitation

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There is dire need for (long-range) precipitation forecasts in the west and other parts of the world.

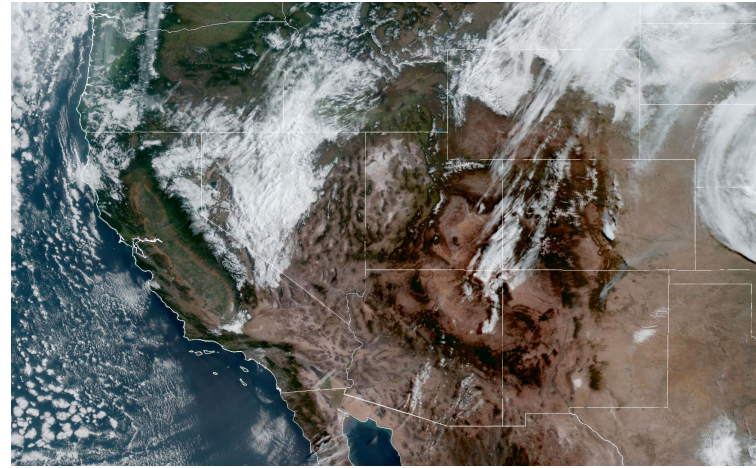
How will the UFS deliver an S2S forecast system?

UFS partners throughout its modeling components.

With limited funding, it is essential to partner, e.g.:

- NCAR
- GFDL-SPEAR
- NASA-GEOS
- Others?

Weigh costs, benefits, options



# Earth Prediction Innovation Center (EPIC)

EPIC underpins NOAA's strategy to engage the community to advance forecast systems:

- Move UFS to the cloud
- Provide forecast-challenge test cases
- Provide software engineering, training and community support
- Grow the UFS community: private sector, forecasters

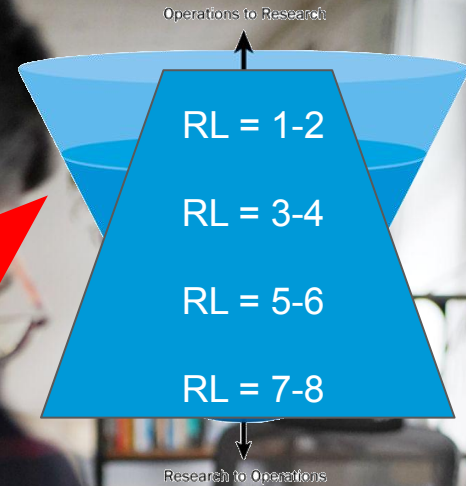
Focus first on 1-2 systems end-to-end:

- Short Range Weather
- Land

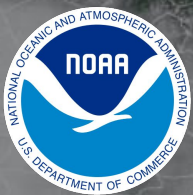
GOAL: Enable rapid incorporation of community innovations into operational forecast system:

- Days not Years!

**Innovation**







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**THANK YOU**



[wpo.noaa.gov](http://wpo.noaa.gov)



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# March 22, 2022 - Arabi Tornado Event

## Social Vulnerability Index - New Orleans

